J. Symbolic Computation (1991) **11**, 419

Editorial

This volume deals with a new approach to symbolic computations in applied geometry. The common theme of the papers in this issue is the use of algorithms based on classical invariant theory. The applications discussed here include algebraic complexity theory, scene analysis, structural rigidity, automated geometry theorem-proving, and representations of the symmetric group.

This collection arose from a workshop held at the Institute for Mathematics and its Applications in Minneapolis, October 12-16, 1987. During the week it was intended to study coordinate-free algebraic structures and algorithms for computational geometry. These methods include the Cayley (or Grassmann) algebra, the bracket algebra of invariants of the general linear group, and the Cayley–Menger algebra which is generated by Euclidean invariants. These structures, because of their coordinate-free (invariant) nature, lie closer to synthetic geometry than the usual algebra of coordinates with respect to a fixed frame of reference. This point of view may be regarded as a computational version of Felix Klein's Erlanger Program.

Six of the papers in this volume were presented in Minneapolis, and the other three papers were submitted in response to a solicitation for this issue. We wish to emphasize that the refereeing procedure used by the editors was strictly anonymous. We hope that the new results in this collection will stimulate further work in this fascinating new field of symbolic computation.

We would like to thank the Institute for Mathematics and its Applications for its support of our original workshop, and Bruno Buchberger for his continued encouragement and support of this project.

Bernd Sturmfels
Neil White

0747-7171/91/050419+01 $03.00/0